REMARKS

Claims 112-141, 151-168, 185-216 and 226-243 are currently pending in the application. The foregoing separate sheets marked as "Listing of Claims" show all the claims in the application, with an indication of the current status of each.

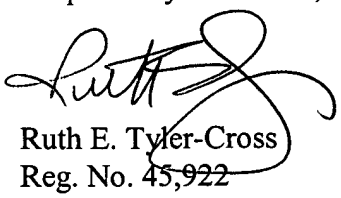
Applicant thanks Examiner for the indication in the Office Action dated 10/15/2004 that all claims in the application are allowed. Further to Examiner's comments in that Office Action, Applicant has hereby amended the specification by replacing the first paragraph of the specification with a replacement paragraph that recites that the parent application of the present application is now abandoned and is no longer copending.

Further, Applicant herewith submits a corrected Sequence Listing for the application in which the sequences on page 89 and the sequences on page 69 are listed as SEQ ID NOS: 15 and 16 and SEQ ID NOS: 17 and 18 , respectively. In addition, the specification has been amended in order to replace the two paragraphs that contain the sequences, paragraph [0380] on page 89 and paragraph [0329] on page 69, with replacement paragraphs that contain the SEQ ID NOS. Applicant submits that these amendments to the specification do not introduce any new matter, and requests entry of the replacement paragraphs. Applicant notes that the original paragraph [0380] contained underlining in the text within the sequence (the first 23 nucleotides) to indicate the T7 promoter sequence. This underlining has been retained in order to remain true to the original text, and should not be mistaken for new text, even though the new SEQ ID NOS. are also underlined to show that they are being added.

In view of the foregoing, Applicant submits that the application is now in *prima facie* condition for allowance. Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at 703-787-9400 (fax: 703-787-7557; email: ruth@wcc-ip.com) to discuss any other changes deemed necessary in a telephonic or personal interview.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



Ruth E. Tyler-Cross
Reg. No. 45,922

Whitham, Curtis & Christofferson, P.C.
11491 Sunset Hills Road, Suite 340
Reston, VA 20190
703-787-9400
703-787-7557 (fax)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of Betenbaugh et al.

Serial number: 09/930,440 Group Art Unit: 1652

Attorney Docket Number: 03940077pa Examiner: Rao

Filed: 2001-08-16

For: ***"ENGINEERING INTRACELLULAR SIALYLATION PATHWAYS"***

SUBMISSION OF SUBSTITUTE SEQUENCE LISTING AND STATEMENT TO SUPPORT FILING IN ACCORDANCE WITH 37 C.F.R.§ 1.821-1.825

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to an Office Action mailed 10/15/2004, we enclose herein a corrected substitute computer readable form (diskette) and a corrected substitute paper copy of the sequence listings for the above-identified patent application. Please replace the Sequence Listing of the application with this substitute Sequence Listing. Also enclosed is a verified statement that the content of the paper and computer readable copies are the same and include no new matter.

Respectfully submitted,

Ruth E. Tyler-Cross
Registration No. 45,922

Whitham, Curtis & Christofferson
11491 Sunset Hills Road; Suite 340
Reston, VA 20190
703-787-9400

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of Betenbaugh et al.

Serial number: 09/930,440

Attorney Docket Number: 03940077pa

Filed: 2001-08-16

For: ***"ENGINEERING INTRACELLULAR SIALYLATION PATHWAYS"***

STATEMENT TO SUPPORT FILING AND SUBMISSION IN ACCORDANCE WITH 37 C.F.R.§§ 1.821-1.825

Assistant Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450
Mail Stop SEQUENCE

Dear Sir:

In connection with a Substitute Sequence Listing submitted concurrently herewith, the undersigned states that:

1. the submission, filed herewith in accordance with 37 C.F.R.§ 1.821 (g), does not include new matter;

2. the content of the attached paper copy and the attached computer readable copy of the Sequence Listing, submitted in accordance with 37 C.F.R.§ 1.821(c) and (e), respectively, are the same; and

3. all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that

such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Respectfully submitted,

Ruth E. Tyler-Cross

Reg. No. 45,922

12/09/04

Date

SEQUENCE LISTING

<110> Betenbaugh, Michael J.
Lawrence, Shawn J.
Lee, Yuan C.
Coleman, Timothy A.

<120> Engineering Intracellular Sialylation Pathways

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<141> 2001-08-16

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<151> 1999-03-02

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Gln Val Ala Glu Glu Trp Val Thr Lys Gly Lys Asp Lys Leu Asp Gln
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Val Ile Ile His Val Gly Ala Leu Ser Leu Lys Glu Ser Gln Glu Leu
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100 105 110

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His Leu Ala Gly Val Pro Leu Ile Gly Trp Val Leu Arg Ala Ala Leu
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Asp Ser Gly Ala Phe Gln Ser Val Trp Val Ser Thr Asp His Asp Glu
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Ile Glu Asn Val Ala Lys Gln Phe Gly Ala Gln Val His Arg Arg Ser
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Ser Glu Val Ser Lys Asp Ser Ser Thr Ser Leu Asp Ala Ile Ile Glu
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Phe Leu Asn Tyr Xaa Asn Glu Xaa Asp Ile Val Gly Asn Ile Gln Ala
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Thr Ser Xaa Cys Leu His Pro Thr Asp Leu Gln Lys Val Ala Glu Met
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Ile Arg Glu Glu Gly Tyr Asp Ser Xaa Phe Ser Val Val Arg Arg His
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Ile Glu Met Gly Tyr Leu Gln Gly Gly Lys Met Ala Tyr Tyr Glu Met
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Lys Glu Ile Lys Leu Leu Val Cys Asn Ile Asp Gly Cys Leu Thr Asn
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Gly His Ile Tyr Val Ser Gly Asp Gln Lys Glu Ile Ile Ser Tyr Asp
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Val Lys Asp Ala Ile Gly Ile Ser Leu Leu Lys Lys Ser Gly Ile Glu
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Val Arg Leu Ile Ser Glu Arg Ala Cys Ser Lys Gln Thr Leu Ser Ser
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35 40 45

Asp Cys Ala Lys Phe Gln Lys Ser Glu Leu Glu Phe Lys Phe Asn Arg
50 55 60

Lys Ala Leu Glu Arg Pro Tyr Thr Ser Lys His Ser Trp Gly Lys Thr
65 70 75 80

Tyr Gly Glu His Lys Arg His Leu Glu Phe Ser His Asp Gln Tyr Arg
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Glu Leu Gln Arg Tyr Ala Glu Glu Val Gly Ile Phe Phe Thr Ala Ser
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Gly Met Asp Glu Met Ala Val Glu Phe Leu His Glu Leu Asn Val Pro
115 120 125

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Ser Met Asp Thr Met Lys Gln Val Tyr Gln Ile Val Lys Pro Leu Asn
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Glu Asp Val Asn Leu Arg Val Ile Ser Glu Tyr Gln Lys Leu Phe Pro
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Asp Ile Pro Ile Gly Tyr Ser Gly His Glu Thr Gly Ile Ala Ile Ser
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225                 230                 235                 240

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Glu Lys Leu Gly Lys Ser Val Val Ala Lys Val Lys Ile Pro Glu Gly
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Thr Ile Leu Thr Met Asp Met Leu Thr Val Lys Val Gly Glu Pro Lys
305                 310                 315                 320

Ala Tyr Pro Pro Glu Asp Ile Phe Asn Leu Val Gly Lys Lys Val Leu
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Ala Ile Ala Pro Lys Ala Glu Tyr Gln Ile Lys Asn Thr Gly Glu Leu
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Tyr Leu His Leu Met Glu Tyr Ala Val Ser Leu Asn Leu Asp Val Phe
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Ser Thr Pro Phe Asp Glu Asp Ser Ile Asp Phe Leu Ala Ser Leu Lys
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Gln Lys Ile Trp Lys Ile Pro Ser Gly Glu Leu Leu Asn Leu Pro Tyr
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Leu Glu Lys Ile Ala Lys Leu Pro Ile Pro Asp Lys Lys Ile Ile Ile
    130                 135                 140

Ser Thr Gly Met Ala Thr Ile Asp Glu Ile Lys Gln Ser Val Ser Ile
145                 150                 155                 160

Phe Ile Asn Asn Lys Val Pro Val Gly Asn Ile Thr Ile Leu His Cys
                165                 170                 175

Asn Thr Glu Tyr Pro Thr Pro Phe Glu Asp Val Asn Leu Asn Ala Ile
            180                 185                 190

Asn Asp Leu Lys Lys His Phe Pro Lys Asn Asn Ile Gly Phe Ser Asp
        195                 200                 205

His Ser Ser Gly Phe Tyr Ala Ala Ile Ala Ala Val Pro Tyr Gly Ile
    210                 215                 220

Thr Phe Ile Glu Lys His Phe Thr Leu Asp Lys Ser Met Ser Gly Pro
225                 230                 235                 240

Asp His Leu Ala Ser Ile Glu Pro Asp Glu Leu Lys His Leu Cys Ile
                245                 250                 255

Gly Val Arg Cys Val Glu Lys Ser Leu Gly Ser Asn Ser Lys Val Val
            260                 265                 270

Thr Ala Ser Glu Arg Lys Asn Lys Ile Val Ala Arg Lys Ser Ile Ile
        275                 280                 285

Ala Lys Thr Glu Ile Lys Lys Gly Glu Val Phe Ser Glu Lys Asn Ile
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Thr Thr Lys Arg Pro Gly Asn Gly Ile Ser Pro Met Glu Trp Tyr Asn
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<223> n = i

<220>
<221> misc_feature
<222> (12)..(12)
<223> n = i

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (17)..(17)
<223> n = g or c

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = i

<400> 10
ganntngann nnccngnnca 20

<210> 11
<211> 20
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer
T,G,I,C/G,C,I,G,G,I,I,I,G/A,T,C,T/G/A,A,T/A,C/T,T,C

<220>
<221> misc_feature
<222> (3)..(3)
<223> n = i

<220>
<221> misc_feature
<222> (4)..(4)
<223> n = c or g

<220>
<221> misc_feature
<222> (6)..(6)
<223> n = i

<220>
<221> misc_feature
<222> (9)..(9)
<223> n = i

<220>
<221> misc_feature
<222> (10)..(10)
<223> n = i

<220>
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<222> (11)..(11)
<223> n = i

<220>
<221> misc_feature
<222> (12)..(12)
<223> n = g or a

<220>
<221> misc_feature
<222> (15)..(25)
<223> n = t, g or a

<220>
<221> misc_feature
<222> (17)..(17)
<223> n = t or a

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = c or t

<400> 11
tgnncnggnn nntcnanntc 20

<210> 12
<211> 20
<212> DNA

<213> Artificial

<220>
<223> synthetic oligonucleotide primer A, C/A/G, C/T, T,C,G/A,T,C,I,C,C,I,C,C,I,I,I,G/A,T,G

<220>
<221> misc_feature
<222> (2)..(2)
<223> n = c, a or g

<220>
<221> misc_feature
<222> (3)..(3)
<223> n = c or t

<220>
<221> misc_feature
<222> (6)..(6)
<223> n = g or a

<220>
<221> misc_feature
<222> (9)..(9)
<223> n = i

<220>
<221> misc_feature
<222> (12)..(12)
<223> n = i

<220>
<221> misc_feature
<222> (15)..(15)
<223> n = i

<220>
<221> misc_feature
<222> (16)..(16)
<223> n = i

<220>
<221> misc_feature
<222> (17)..(17)
<223> n = i

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = g or a

<400> 12
anntcntcnc cnccnnnntg 20

<210> 13
<211> 54
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 13
tgtaatacga ctcactatag ggcggatccg ccatcatgcc gctggagctg gagc 54

<210> 14
<211> 34
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 14
gtacggtacc ttattaagac ttgatttttt tgcc 34

<210> 15
<211> 54
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 15
tgtaatacga ctcactatag ggcggatccg ccatcatgga ctcggtggag aagg 54

<210> 16
<211> 44
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 16
gtacggtacc ttactatttt tggcatgaat tattaacttt ttcc 44

<210> 17
<211> 14
<212> PRT
<213> Escherichia coli

<400> 17

Ile Ile Ala Ile Ile Pro Ala Arg Ser Gly Ser Lys Gly Leu
1 5 10

<210> 18
<211> 14
<212> PRT
<213> Homo sapiens

<400> 18

Leu Ala Ala Leu Ile Leu Ala Arg Gly Gly Ser Lys Gly Ile
1 5 10